Ice Jam Monitoring on the Mohawk River, Schenectady NY

Gary Wall and Chris Gazoorian
USGS New York Water Science Center, Troy NY

During the winter of 2012-13 the New York Water Science Center, in cooperation with the New York State Department of Environmental Conservation, the New York State Power Authority, Brookfield Renewable Power, and Union College, launched a web-based monitoring system (http://ny.water.usgs.gov/flood/MohawkIce/) to assist emergency managers assess river conditions and the potential for ice-jam flooding near Schenectady, NY. Ice jam floods are a threat to lives and property in low-lying areas along the Mohawk River, particularly in the vicinity of the Stockade District in Schenectady. Lederer and Garver (2001) estimated that 80% of historic Mohawk River floods in Schenectady are a result of winter snowmelt and ice floes.

The monitoring system consists of three stage-only streamgages and one index-velocity streamgage along a 10.8 mile reach of the Mohawk River. In addition, two web cameras are available to the public at key locations along the reach. NWISweb graphs on the monitoring website depict gage height at all 4 gages as well as graphs of ice-related backwater in each of the 3 reaches between the gages. Ice-related backwater is derived by computing the difference in water surface slopes during ice and ice-free conditions for a given streamflow. Because ice jams often occur during rising streamflows, it's oftentimes difficult to simply look at the difference in gage height observations between adjacent streamgages and derive how much of that difference is due to ice and how much is associated with the normal slope of the water surface associated with the observed streamflow. Our approach allows us to partition these influences on the observed gage height and better identify the flood risk associated with ice in the channel.